

Impact of Acute Lumbar Disk Herniation on Sexual Function in Male Patients

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Study Design: Prospective observational study.

Purpose: In this study, we determined the effects of lumbar disk herniation (LDH) on male sexual activity and whether surgical intervention improved any related sexual dysfunction.

Overview of Literature: The impact of surgery on sexual activity has been extensively studied in arthroplasty, uro-gynecological surgery, and stroke, but there are relatively few studies on spine surgery, and none involve an Asian population to the best of our knowledge.

Methods: We evaluated sexually active male patients (n=22, 40.8±6.8 years) admitted for microdiscectomy with a questionnaire for assessing sexual function before and 8 weeks after surgery. The questionnaire included the Oswestry Disability Index, Hospital Anxiety Depression Score, and Brief Sexual Function Inventory (BSFI), as well as questions about perceived sexual dysfunction (frequency, performance, satisfaction).

Results: The average preoperative Visual Analog Scale (VAS) score was 4.36±2.59 (n=18) for low back pain (LBP) and 6.81±2.1 (n=22) for leg pain. The mean preoperative BSFI score was 27.8±11.2. Among the five BSFI components, sexual drive was reduced in 63.0% of patients, while erection and ejaculation were affected in 40.9% and 31.8%, respectively. The VAS score for LBP had a negative correlation with the preoperative BSFI score ($p<0.03$). After LDH onset, 54.5% of patients noted a decrease in frequency, and 77.2% described a decrease in desire and satisfaction. At 8 weeks after surgery, the mean BSFI score significantly improved to 33.23 ($p=0.002$). Sexual drive was normal in 77.7% of patients, and erection and ejaculation were normal in 77.7% and 91.0%, respectively. Overall, 59.1% had resumed sexual intercourse within 6 weeks of surgery.

Conclusions: LDH resulted in sexual dysfunction in up to 77% of patients, which significantly improved after surgery. By 6 weeks, the majority had resumed sexual activity without undue discomfort. Therefore, this study supports counseling for patients with LDH about sexual function.

Keywords: Lumbar disc; Sexual dysfunction; Back pain; Male; Counseling

Introduction

Lumbar disk herniation (LDH), which presents with severe lower back pain (LBP) with radiation to the leg,

can affect an individual's normal functions [1]. Among patients with LBP, up to 72% have reported varying degrees of disturbance in their sexual activity [2]. Sexual dysfunction in people with lumbar disc diseases can be

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caused by actual pain or fear of aggravating pain, physical restriction, depression associated with chronic pain, or adverse medication effects [3]. The mental, physical, and emotional status of humans have strong associations with their sexual health; thus, sexual dysfunction can result in lowered self-esteem and hinder personal and social well-being [4].

Patients seeking surgical consultation for severe radiculopathy due to LDH inquire about physical activity modification, ergonomics, and rehabilitation but rarely about the effects of sexual activity. Sociocultural taboos and perceived stigma around sexuality can inhibit patients from discussing their sexual health, and most patients deliberately avoid talking about it due to modesty or fearing embarrassment [5]. Inadequate knowledge can further worsen the issue by means of overreaction (i.e., unwanted sexual abstinence) or insufficient measures (i.e., avoiding unusual postures or vigorous activity).

The highest prevalence of LDH is among patients aged 30–50 years, which is also the period of peak sexual activity [6,7]. Studies have shown that lumbar flexion increases intradiscal pressure and men are mostly in a lumbar-flexed position during coitus [8]. Hence, the presence of LDH can affect sexual function in the following ways: (1) axial and radicular pain can be aggravated by sexual activity; (2) the presence of severe pain can decrease sexual performance; and (3) compression of the cauda equina nerve roots can result in altered sensation in the perineal areas, potentially affecting sexual performance and satisfaction. Therefore, it is essential to study the physiological and psychological effects of LBP and sciatica associated with LDH on sexual function. The impact of surgery on sexual activity has been extensively studied in arthroplasty, uro-gynecological surgery, and stroke [9–11], but studies on spine surgery are relatively limited, and none involve an Indian population to the best of our knowledge.

Spine surgeons should also have adequate knowledge about the effects of LDH on patients' sexual function and whether surgery positively or negatively affects sexual activity. Sexual desire, erection, ejaculation, and satisfaction are independent components of sexual function, and the extent of affliction in each by LDH has not been studied before. Hence, for proper preoperative counseling and to guide patients in performing postoperative activity with a certain level of confidence, surgeons must have knowledge about the effects of LDH and spine surgery on sexual activity. Therefore, in this study, we determined the effects

of LDH on sexual activity and whether surgical intervention can improve any related sexual dysfunction.

Materials and Methods

We conducted this prospective, observational study in the Department of Spine Surgery of Ganga Medical Centre and Hospitals, Coimbatore, India from November 2018 to April 2019 after approval from the Institutional Review Board (IRB approval no., GMCHIRB/2019/03/05). We obtained informed written consent from all participants. We counseled all consecutive male patients aged >18 years with LBP and radicular leg pain with radiological evidence of LDH in magnetic resonance imaging and planned for microlumbar discectomy about the study, including those who were willing to participate with an informed consent. We excluded female patients, male patients <18 and >60 years of age, patients with significant motor power deficits or cauda equina syndrome, and those who were apprehensive about participating.

Before data collection, we clearly explained to the participants about the confidentiality of their identity and data and how we would provide proper privacy while they answered the questionnaire. The investigator established a good rapport with the participants and answered all of their queries, taking care to avoid any leading questions.

We recorded patients' preoperative demographic data, such as age, marital status, years of marriage, spouse's age, number of children, and mean symptom duration. Clinical data included pain type and duration, Visual Analog Scale (VAS) scores for LBP and leg pain, factors aggravating pain, comorbidities, and current medications. Questions regarding sexual function included usual weekly frequency of sexual intercourse, change in frequency after the onset of LDH pain, change in sexual desire and satisfaction after pain onset, and any specific sexual problems (e.g., decreased desire, premature or delayed ejaculation, erectile dysfunction) and their duration.

Since guidelines that discuss resuming sexual function after lumbar microsurgery are unavailable, we did not provide specific instructions to the patients about this issue, advising them to resume sexual function on the basis of their comfort levels. Hence, during the postoperative follow-up visit at 8 weeks, we sought the following details: When was first intercourse after surgery? Was there a change in sexual desire or satisfaction after surgery? If specific sexual problems were present before surgery, were

they improved, the same, or worse after surgery?

We recorded scores on the Oswestry Disability Index (ODI) [12] and Brief Sexual Function Inventory (BSFI) for men in the preoperative period (considering the past 1 month before surgery) and at week 8 in the postoperative period [13] (Appendix 1). The BSFI, a discrete screening tool for sexual function, assesses sexual drive, erection, ejaculation, sexual problem perception, and overall satisfaction in male patients. Among these five components, each had a maximum score of 9, 12, 8, 12, and 4, respectively, with a maximum total score of 45. For analysis, we considered that a score of <50% in each component showed impairment. We performed psychological screening for anxiety and depression using the Hospital Anxiety Depression Scale (HADS) in the preoperative period [14] (Appendix 2).

We analyzed the data using IBM SPSS software ver. 20.0 (IBM Corp., Armonk, NY, USA). We calculated descriptive statistics for the background variables. We used Pearson's correlation coefficient to determine the correlation between two continuous variables. We tested the association between categorical variables using the chi-square test. We performed the Mann-Whitney *U*-test and Wilcoxon signed-rank test for the quantitative variables, as these data do not follow normal distribution. We considered $p < 0.05$ as statistically significant.

Results

1. Patient demographics

This study included 22 male patients with an average age of 40.78 ± 6.87 years. All patients were married for a mean 13.77 ± 8.11 years; their spouses' average age was 36.77 ± 6.73 years. Overall, 13.6% of patients were uneducated, while 45.3% had school-level education, and 40.7% were college graduates (Table 1). Four patients were manual laborers, nine were skilled workers, eight were professionals, and one was a businessman. All 22 patients had radiating leg pain, with 18 patients also having LBP. The average duration of symptoms was 6.88 ± 3.27 months. The level of pathology was L4–5 in 12 patients, L5–S1 in eight, and L3–4 in two.

2. Patient outcomes scores

The average preoperative VAS score was 4.36 ± 2.59 for

Table 1. Patient demographics

Characteristic	Value
Age (yr)	40.78±6.87
Age of spouse (yr)	36.77±6.73
Years of married life (yr)	13.79±8.11
Educational status	
Uneducated	2
School	11
Diploma	1
Graduate	8
Occupation	
Unemployed	0
Manual labour	4
Skilled labour	9
Professional	8
Business	1
Comorbidities	
Diabetes mellitus	2
Hypertension	1
Mitral regurgitation	1
Addictive habits	
Smoking	1
Smoking & alcohol	1

Values are presented as mean±standard deviation or number.

Table 2. Comparison between preoperative and postoperative functional scores

Variable	Before surgery	After surgery at 8 weeks	<i>p</i> -value
VAS–back pain	4.36±2.59	3.12±2.47	0.11
VAS–leg pain	6.81±2.10	2.37±1.90	<0.0001
ODI	29.5±9.48	11.0±6.47	<0.0001
BSFI	27.86±11.17	33.23±9.46	0.002
Reduced performance (%)			
Sexual drive	63.0	22.3	0.006
Erection	40.9	22.3	0.19
Ejaculation	31.8	9.0	0.06
Problem assessment	36.3	9.0	0.03
Satisfaction	45.4	36.3	0.76

Values are presented as mean±standard deviation or %, unless otherwise stated.

VAS, Visual Analog Scale; ODI, Oswestry Disability Index; BSFI, Brief Sexual Function Inventory.

LBP and 6.81±2.10 for leg pain. The mean ODI score was 29.50±9.48. In the HADS scoring for anxiety, nine patients were in the normal range, six were borderline, and seven were in the anxiety range. For depression, seven patients were normal, seven were borderline, and eight in the depressed range.

In the preoperative period, the mean BSFI score was 27.86±11.17. Among the five BSFI components, sexual desire was reduced in 63.0% of the patients, while erection and ejaculation were reduced in 40.9% and 31.8%, respectively. For satisfaction with sexual activity, 45.4% observed it to be low (Table 2). Patient age, years of marriage, and comorbidity affected the preoperative BSFI score, whereas addictive habits had no influence (Table 3). Univariate analysis showed a significant decrease in the BSFI problem assessment component in patients >40 years of age, in overall satisfaction in patients married for >10 years, and in ejaculation, problem assessment, and total scores in patients with comorbidities.

The LBP VAS scores had a negative correlation with the preoperative BSFI scores ($p<0.03$), whereas those for leg pain had no significant correlation. Pain duration had no significant bearing on BSFI score. There was an inverse correlation between ODI and preoperative BSFI scores, as well as postoperative BSFI scores ($p<0.01$). We noted a statistically significant negative correlation between the HADS anxiety scores and the preoperative BSFI scores ($p<0.01$), as well as the postoperative BSFI scores ($p<0.02$); the HADS depression scores had no statistical significance (Table 4).

3. Frequency

The frequency of sexual intercourse in the preoperative period (the 3 months before surgery) was mentioned as 2–3× per week by nine patients, once per week by nine patients, and rarer than once per week by four patients. After LDH development, 54.4% of the patients reported a decrease in the frequency of sexual intercourse, and 77.3% described a decrease in desire or satisfaction. The change in frequency and desire had a statistically significant correlation with the preoperative BSFI scores ($p<0.001$).

4. Patient postoperative scores

At 8 weeks after surgery, the mean ODI score was 11.0±6.5. The VAS score for LBP decreased to 3.12±2.47

Table 3. Stratified analysis of the effect of age, years of marriage, comorbidities, and addictive habits on individual components of BSFI

Component of BSFI	Age (yr)	Median value	Mean rank	p-value	Years of marriage	Median value	Mean rank	p-value	Comorbidities	Median value	Mean rank	p-value	Addictive habits	Median value	Mean rank	p-value
Sexual drive	<40	8	10.77	0.595	<10	4	10.50	0.541	Yes	3.0	6.75	0.1	Yes	3.5	9.25	0.601
	>40	5	12.23		>10	5	12.19		No	5.0	12.56		No	5.0	11.73	
Erection	<40	4	11.45	0.974	<10	8	11.39	0.946	Yes	4.5	6.00	0.06	Yes	8.0	13.00	0.73
	>40	8	11.55		>10	8	11.58		No	9.0	12.72		No	8.0	11.35	
Ejaculation	<40	7	11.95	0.729	<10	7	12.39	0.573	Yes	1.5	5.25	0.025	Yes	4.0	10.00	0.718
	>40	7	11.05		>10	7	10.88		No	8.0	12.89		No	7.0	11.65	
Problem assessment	<40	11	14.18	0.050	<10	11	14.44	0.073	Yes	4.0	4.88	0.022	Yes	6.5	8.00	0.418
	>40	6	8.82		>10	6	9.46		No	10.5	12.97		No	9.0	11.85	
Overall satisfaction	<40	3	13.59	0.10	<10	3	14.61	0.044	Yes	1.0	7.13	0.109	Yes	2.5	12.25	0.854
	>40	2	9.41		>10	2	9.35		No	3.0	12.47		No	3.0	11.43	
Total score	<40	32	12.50	0.470	<10	32	12.61	0.504	Yes	12.0	5.25	0.033	Yes	24.5	11.00	0.909
	>40	26	10.50		>10	32	10.73		No	33.5	12.89		No	30.0	11.55	

Statistically significant results are marked in bold. BSFI, Brief Sexual Function Inventory.

Table 4. Correlation between various clinical parameters and BSFI

Parameter 1	Parameter 2	Pearson correlation	Significance (2-tailed)	Significance
Duration of pain	BSFI-Preop	-0.163	0.470	Not significant
Duration of pain	BSFI-Postop	-0.011	0.962	Not significant
HADS-anxiety	BSFI-Preop	-0.514	0.014	Significant
HADS-anxiety	BSFI-Postop	-0.479	0.024	Significant
HADS-depression	BSFI-Preop	-0.241	0.279	Not significant
HADS-depression	BSFI-Postop	-0.240	0.283	Not significant
ODI	BSFI-Preop	-0.596	0.003	Significant

BSFI, Brief Sexual Function Inventory; Preop, preoperative; Postop, postoperative; HADS, Hospital Anxiety Depression Scale; ODI, Oswestry Disability Index.

and that for leg pain to 2.37 ± 1.9 . The postoperative ODI and VAS for leg pain scores showed significant improvements ($p < 0.05$); the VAS score for LBP did not (Table 2).

The mean postoperative BSFI score showed a significant improvement (33.23 ± 9.46 , $p = 0.002$). Among the five subcomponents, sexual drive, ejaculation, and problem perception showed statistically significant improvements ($p < 0.05$) (Table 2). Erection and sexual satisfaction also showed postoperative improvements, although the p -value was > 0.05 . Of the 17 patients who mentioned a decrease in sexual desire or satisfaction, 15 (88.2%) had subjective improvement in the postoperative period, while two had no difference. The majority of patients, 59.1%, had resumed sexual intercourse within 6 weeks of surgery. The remaining patients mentioned the fear of eliciting pain as the reason for delaying sexual activity.

Discussion

We observed that lack of sexual desire leading to decreased frequency was common in up to 77% of patients with LDH. Patients with coexistent LBP had greater affliction than did those with isolated radiculopathy. Surgery significantly improved the pain with corresponding improvements in sexual function. Pain associated with LDH has moderate-to-severe detrimental effects on various aspects of life and sexual dysfunction due to physical constraint, emotional distress, and psychological factors [15-17]. The incidence of LDH is approximately 5-20 per 1,000 adults, involving more male patients in their third to fifth decades of life [18]. However, the afflicted patients rarely made any inquiries regarding sexual activity due to the taboos around the subject. Counseling about sexual dysfunction by the treating surgeon or physiotherapist is

also deficient due to the lack of knowledge or specialized training and patient's lack of initiative [19].

Psychological factors can play a vital role in sexual performance [20]. Psychological assessment in our study indicated that $> 60\%$ of patients had anxiety (definite and borderline), which statistically correlated to preoperative sexual dysfunction. Akbas et al. [21] had similar findings in their study on 43 patients with LDH in which 59% had HADS scores indicating anxiety, and a significant statistical correlation was noted between anxiety and sexual dysfunction. Anxiety can be caused by pain, fear about the surgical intervention and its consequences, or misperceptions about the disease itself. Patients who are more anxious tend to avoid any activity they perceive as aggravating pain, which can explain the decreased desire and satisfaction with sexual activity. Furthermore, individuals with anxiety disorder are more prone to performance anxiety related to sex [20], which can lead to decreased desire and satisfaction.

Horst et al. [22] and Kwan et al. [23] have observed a correlation between depression and sexual dysfunction, and although there was a negative correlation between depression and BSFI score in our study, the statistical significance was weak. Depression initially affects the sexual drive alone, and other factors are involved only after a long duration of chronic illness. However, the average symptom duration in our study population was only 6 months, which can explain the lesser effects of depression on sexual function. Furthermore, the study population was relatively young, and as such, depression may be superseded by anxiety.

The BSFI assesses the sexual drive, erection, ejaculation, problem assessment, and overall satisfaction in male. The maximum BSFI score is 45 which indicate a perfect sexual

function. In our study, the total preoperative BSFI score was 27.86, which was inversely related to the ODI score. ODI measures the extent of disability in a patient with spinal disorders and associated back or leg pain. The significant statistical correlation between the VAS scores for LBP and preoperative BSFI scores is understandable, because LBP can affect sexual activity directly and indirectly. While the preoperative BSFI scores indicated an overall decrease in sexual function, the five individual components also showed a decline. Sexual drive was low in most patients, 63%, followed by difficulties with erection and ejaculation. Correspondingly, sexual satisfaction was low in 45% of the patients.

All patients had good functional outcomes after surgery as measured by the ODI, and of the 17 patients who mentioned a decrease in desire and satisfaction with sexual activity, 15 had improvement in both areas after the surgery. Kanayama et al. [24] have concluded in their study that surgical treatment improved the quality of sexual activities, and our study had a similar finding of statistically significant improvement in BSFI scores in the postoperative follow-up period as compared to those of the preoperative period. Sexual drive improved in 78.7% of the patients, while ejaculation and erection improved in 91.0% and 77.7%, respectively.

Owing to the lack of existing guidelines, the patients were not advised about a specific waiting period before returning to sexual activity after surgery. The majority had resumed sexual activity within 6 weeks of surgery; the remainder cited a fear of eliciting pain as the reason for the delay. No patients reported any increase in pain after their first sexual intercourse after surgery. These findings underline the importance of proper counseling about sexual activity in the postoperative period to avoid unnecessary abstinence, which can lead to emotional distress and interpersonal relationship issues [25].

Considering the lack of data about the optimal time for resuming sexual activity after spine surgery [26], the advice provided by the spine surgeon or physiotherapist can depend on their own clinical experience and their postsurgical exercise guidelines. Early return to sexual activity can increase pain, which can result in anxiety and a consequent fear about sex, whereas an unnecessary delay in returning can lead to interpersonal distress. Therefore, it is prudent to develop an appropriate protocol for return to sexual activity after spine surgery.

Since sexual activity is considered a medium-level

physical activity similar to brisk walking or bicycling, a 6-week wait is considered reasonable before resuming sexual activity after spinal surgery [27]. In the absence of guidelines, most of our patients participated in sexual activity within 6 weeks after surgery, which we consider is an appropriate time period that can be discussed during patient counseling.

This study has several limitations. First, the follow-up period of 2 months was short, as participants might have further symptom improvement over time. Second, the number of participants was small.

Conclusions

LDH resulted in sexual dysfunction in 77% of the patients, which significantly improved after surgery. Patients with a combination of axial and radicular pain were more affected than were those with pure radicular pain, and anxiety rather than depression was more detrimental to patient sexual health. Proper counseling regarding postoperative sexual activity is crucial for patient optimal overall functional outcomes.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Author Contributions

Conception and design: PK, RMK; Analysis and interpretation: PK, RMK; Writing the article: PK, RMK; Data collection: PK; Provision of materials, patients, or resources: RMK, APS, SR; Statistical expertise: PK, RMK; Obtaining funding, RMK, APS, SR; Literature search: PK; Administrative, technical, or logistic support: RMK, SR; Critical revision of the article: APS, SR; Final approval of the article: RMK, APS, SR.

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Appendix 1. A Brief Sexual Function Inventory**Sexual drive**

Let's define sexual drive as a feeling that may include wanting to have a sexual experience (masturbation or intercourse) thinking about having sex or feeling frustrated due to lack of sex.

1) During the past 30 days, on how many days have you felt sexual drive?

No days everyday	Only a few days	Some days	Most days	Almost
1	2	3	4	5

2) During the past 30 days, how would you rate your level of sexual drive?

Not at all	Low	Medium	Medium high	High
0	1	2	3	4

Erections

3) Over the past 30 days, how often have you had partial or full sexual erections when you were sexually stimulated in any way?

Not at all	A few times	Fairly often	Usually	Always
0	1	2	3	4

4) Over the past 30 days, how often have you had erections; how often were they firm enough to have sexual intercourse?

Not at all	A few times	Fairly often	Usually	Always
0	1	2	3	4

5) How much difficulty did you have getting an erection during the last 30 days?

No erections at all	A lot	Some	Little	No difficulty
0	1	2	3	4

Ejaculation

6) Over the past 30 days how much difficulty have you had in ejaculating when you have been sexually stimulated?

Have not had sexual stimulation in the past month	A lot	Some	Little	No difficulty
0	1	2	3	4

7) In the past 30 days, how much did you consider the amount of semen you ejaculate?

Did not climax	Big problem	Medium problem	Small problem	No problem
0	1	2	3	4

Problem assessment

8) In the past 30 days, to what extent have you considered a lack of sex drive to be a problem?

Big problem	Medium problem	Small problem	Very small problem	No problem
0	1	2	3	4

9) In the past 30 days, to what extent have you considered your ability to get and keep an erection a problem?

Big problem	Medium problem	Small problem	Very small problem	No problem
0	1	2	3	4

10) In the past 30 days, to what extent have you considered your ejaculation to be a problem?

Big problem	Medium problem	Small problem	Very small problem	No problem
0	1	2	3	4

Overall satisfaction

11) Overall: during the past 30 days, how satisfied have you been with your sex life?

Very dissatisfied	Mostly dissatisfied	Neutral or mixed	Mostly satisfied	Very satisfied
0	1	2	3	4

Appendix 2. Hospital Anxiety and Depression Scale

Tick the box beside the reply that is closest to how you have been feeling in the past week.

Don't take too long over you replies: your immediate is best.

D	A	Questions	D	A	Questions
		I feel tense or 'wound up':			I feel as if I am slowed down:
3		Most of the time	3		Nearly all the time
2		A lot of the time	2		Very often
1		From time to time, occasionally	1		Sometimes
0		Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			I get a sort of frightened feeling like 'butterflies' in the stomach:
0		Definitely as much	0		Not at all
1		Not quite so much	1		Occasionally
2		Only a little	2		Quite often
3		Hardly at all	3		Very often
		I get a sort of frightened feeling as if something awful is about to happen:			I have lost interest in my appearance:
3		Very definitely and quite badly	3		Definitely
2		Yes, but not too badly	2		I don't take as much care as I should
1		A little, but it doesn't worry me	1		I may not take quite as much care
0		Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			I feel restless as I have to be on the move:
0		As much as I always could	3		Very much indeed
1		Not quite so much now	2		Quite a lot
2		Definitely not so much now	1		Not very much
3		Not at all	0		Not at all
		Worrying thoughts go through my mind:			I look forward with enjoyment to things:
3		A great deal of the time	0		As much as I ever did
2		A lot of the time	1		Rather less than I used to
1		From time to time, but not too often	2		Definitely less than I used to
0		Only occasionally	3		Hardly at all
		I feel cheerful:			I get sudden feelings of panic:
3		Not at all	3		Very often indeed
2		Not often	2		Quite often
1		Sometimes	1		Not very often
0		Most of the time	0		Not at all
		I can sit at ease and feel relaxed:			I can enjoy a good book or radio or TV program:
0		Definitely	0		Often
1		Usually	1		Sometimes
2		Not often	2		Not often
3		Not at all	3		Very seldom

Please check you have answered all the questions.

Scoring:

Total score: depression (D) _____ Anxiety (A) _____

0–7=normal

8–10=borderline abnormal (borderline case)

11–21=abnormal (case)